GLOBAL CLIMATE CHANGE: AN OVERVIEW

Changes in the Earth's global climate are usually thought of in terms of changes in global temperatures. This is only part of the story, of course, since it may be argued that precipitation patterns and circulation patterns are equally important to mankind's various activities. Nevertheless, we will go along with this bias and concentrate on the various factors that influence global temperature changes.

Solar Forcing works by changing the intensity of this incoming radiation, either by increasing it (bringing about an increase in global temperatures) or decreasing it (bringing about a decrease in global temperatures). Solar emissivity is a function of processes and occurrences taking place within the Sun itself, and is not subject to mankind's influence. Knowledge of the significance of this global-climate changing factor is hampered by a lack of hard evidence as to how solar emissivity has changed over the centuries.

Albedo Forcing works by changing the proportion of solar energy that is absorbed by the globe (69% at present) to the proportion of solar energy that is reflected back into space (31% at present). This 31% reflectance (albedo) is influenced primarily by cloud cover, snow and ice cover, and atmospheric particulates. These phenomena can be influenced by mankind's activities (geoengineering). Very little is known about albedo forcing because we still don't know how to accurately measure the Earth's albedo.

Orbital Forcing works by changing the seasonal patterns of sunshine in the upper northern mid-latitudes (around 65° N). This is brought about by small variations in three of the Earth's orbital cycles that lead to the onset of continental glaciation and to its retreat at approximately 100,000 year intervals. Orbital forcing enjoys the greatest amount of support by both scientific evidence and by

professional climatologists. It is subject to the same kind of geoengineering controls as albedo forcing.

Atmospheric Forcing works by changing the composition of the Earth's atmosphere so as to either increase or decrease the concentration of such "greenhouse" gases as water vapor, carbon dioxide, methane and the like. This, in turn, results in increases or decreases in the Earth's heat budget. Because of mankind's proximity to the atmosphere (we live in it much as a fish lives in water), atmospheric forcing is subject to geoengineering.

The IPCC's position is that all climate-change since 1750 is the result of mankind's increased emission of carbon-dioxide (anthropogenic carbon-forcing).

Summary: It should be noted that all of the above global climate forcing factors are natural processes. They do not have an "ON/OFF" switch. They have always been at work, are at work this very instant, and will continue to work in the foreseeable future. Scholars argue over how much each climate forcing factor contributes at any given time—particularly at the present time.

Virtually all professional atmospheric scientists agree that global climate changes do occur. If you accept the reality of the Ice Ages you accept that much. Virtually all professional atmospheric scientists agree that we are currently in a period of global warming. The evidence is overwhelming. Virtually all professional atmospheric scientists agree that mankind's activities have added to the concentration of carbon dioxide in the Earth's atmosphere. The evidence is overwhelming. Virtually all professional atmospheric scientists agree that this anthropogenic carbon-forcing contributes to this current episode of global warming. The evidence is overwhelming.

Very real disagreements exist as to how much of this global warming is due to carbon-forcing and how much is due to other global climate-forcing factors. Here, the weight of scientific evidence is by no means overwhelming. And it is here that scientific objectivity most often falls victim to political considerations.

